Verification of Translation

US Patent Application based on PCT/JP00/03626

Title of the Invention: BENT GLASS SHEET FOR VEHICLE WINDOW

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am the translator of the document attached and I state that the following is true translation to the best of my knowledge and belief of a part of JP 64(1989)-48315 U (Date of Filing: September 21, 1987).

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Signature of the translator

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Title of the Invention : OPENING AND CLOSING STRUCTURE OF DOOR GLASS OF VEHICLE

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[Prior Art]

In recent years, for the purposes of enhancing an external design and aerodynamic characteristics of a vehicle, a door glass has been of complex curved surface glass that is curved along the body line of the vehicle. The complex curved surface glass has a curved surface, while being in a complicated shape, being curved outwardly from the vehicle substantially along the body line and having a radius of curvature gradually increasing or decreasing in directions toward the front and rear portions of the vehicle.

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[Example]

FIGs. 1 and 2 show an example of the present invention. In FIG. 1, reference numeral 1 denotes a front door glass of a vehicle. The glass has a complex curved surface having a curvature complexly varying along the body line. The glass surface is curved so as to form a convex outwardly from the vehicle (to a near side from a plane on which the figures are

drawn), which has a radius of curvature gradually increasing in a direction toward a rear portion of the vehicle.

A lower side portion 11 of the glass, which is positioned below a waist line of a door panel 2 when the above door glass 1 is raised to be closed, is curved outwardly from the vehicle so as to form a spindle-shaped surface centered on a common axis Ox.

That is, as shown in FIG. 3, in the above lower side portion 11, a front end 11a forms a curved surface having a radius of curvature Ra centered on the axis Ox in an inner portion of the vehicle, and a center portion 11b and a rear end 11c form curved surfaces having radii of curvature Rb and Rc centered on the above axis Ox, respectively. As a result of the relationship $Ra < Rb < Rc$, the above lower side portion 11 has a curved surface of a spindle-shape having a radius of curvature centered on the common axis Ox, which increases gradually in the direction toward the rear portion of the vehicle.

In the door panel 2, guide rails 3A and 3B of U-shaped cross section are provided at the front and the rear. These guide rails 3A and 3B are curved so as to have curvatures that coincide with those of the front end 11a and the rear end 11c of the lower side portion 11 of the door glass, respectively. By the guide rails 3A and 3B, the above front and rear ends 11a and 11b are held so as to be fitted to the guide rails 3A and 3B movably in a vertical direction, respectively.

FIG. 4 shows the details of the holding structure. The front end 11a of the door glass 1, for example, is held by a glass run 32 provided in a rail main body portion 31.

In the opening and closing structure described above, when the door glass 1 is raised and lowered to be opened and closed using an opening and closing mechanism 5 (FIG. 2) according to a conventional technique, the door glass 1 is moved vertically, while the lower side portion 11 is guided to be moved circularly around the central axis Ox by the rails 3A and 3B. As a result, the surface of the glass other than the lower side portion 11 is passed through substantially a center of an opening 21 on the waist line of the door panel 2 in such a manner as to cause almost no displacement. Thus, weatherstrips 4 provided at the edges of the above opening are always in proper contact with the surface of the glass without causing deterioration of a sealing property.

In the above example, the description was directed to a case of the front door glass. However, needless to say, the present invention is applicable to a case of a rear door glass, in which a radius of curvature increases in an opposite direction to that in the above case.